

23	M42	ROLLER COASTER	-this demo is slightly soft.	-mild blocking observed on flat rooftops, green lawns.
24	M43	DUCKS	-mild green fringing visible.	-edge artifacts visible along necks of swans. -minor loss of resolution at surface of water. -green fringing somewhat enhanced.
25	M44	MIRROR	-moderate levels of film noise.	-slight decrease in resolution noticeable on lettering of invitation card. -slight softening of film noise.
26	M45	CHRISTA	-mild judder. -moderate to high level of film noise, primarily 'black noise' with occasional white sparkle.	-film noise appears slightly softened. -background wall appears slightly greener.
27	M46	FOUNTAIN	-absence of any significant film noise.	-very slight loss of resolution.
28	M47	CLOCK #1	-this image exhibits aliasing due to low resolution rendering. -some geometric differences noted between the Reference and test sequences.	-slight reduction in crispness of surfaces.
29	M48	CONNECTIONS	-some geometric differences noted between the Reference and Test sequences.	-edge artifacts noted along most objects. -sparkle observed behind the video insert overlay. -slight reduction in overall crispness noted during the video insert overlay.
30	M49	PICNIC WITH ANTS	-still image with encroaching noise.	-blocking artifacts are very clearly visible as the noise content is increased. -noise area seen to pulsate.

BASIC RECEIVED QUALITY
PICTURE DESCRIPTION

- S1 Metal Tables & Chairs: Overhead view of round tables and chairs on concrete patio stones.
- S5 Tulips: Purple, yellow, pink and white tulips.
- S6 Sculptures: Colourful dinosaurs on wall.
- S8 Toys: Checkers, Chinese checkers, lego, and paint trays.
- S9 Girls with Toys: Two girls playing with toys and books, on a rug.
- S14A Cheshire Cat: Three potted plants with Christmas balls, on black and white checkered floor.
- M1 Window: Blowing curtains over kitchen sink.
- M2 Fax Machine: Sending Quarterly report.
- M4 Mannequin: Rotating in display window with stars in background.
- M5 Living Room: Panning/zooming of camera, from book shelves to stack of art books on table.
- M6 Den: Man getting book off shelf, and sitting on sofa.
- M10 Woman & Room: Woman in green, blue and black argyle sweater getting book, and sitting on sofa.
- M16A Rotating Pyramids: Silver mobile with 4 diamonds spinning, on marble background, with text.
- M35 Crosswalk: Lots of people walking through busy intersection.
- M36 Georgetown Loop: Sightseeing train travelling along mountain track.
- M37 Buckingham Palace: Marching guards in red uniforms.
- M38 Snow Tires / Trees: Creek lined with snowy trees.
- M39 End Zone: Olympic procession into stadium.
- M40 Dream Team: Basketball game.
- M41 Golf: Man teeing off.
- M44 Mirror: Woman putting on make-up, class reunion invitation on dresser.
- M45 Christa: Short haired woman walking down sidewalk.
- M46 Fountain: Man and woman splashing at fountain.
- M47 Clock #1: Internal mechanics of a clock.
- M48 Connections: Flight details given by man in striped jacket.
- M49 Picnic With Ants: Four people at picnic table; still with encroaching noise.

RANDOMIZATION OF BASIC RECEIVED QUALITY TEST MATERIAL

The randomization of test material is undertaken to minimize the occurrence of any patterns in the presentation of video sequences and, ideally, eliminate any related viewer bias. Each Tape Order consists of all test sequences arranged in a pseudo-random fashion. Within each Tape Order, limits are set as to the proximity of identical video sequences, and as to the number of consecutive identical test conditions (Ref.-Test, Test-Ref.), picture attributes (motion / still), and picture sources (film, computer graphic, video camera). The objective is to achieve an overall balance of the foregoing factors. Where cumulative playout time exceeds the storage capacity of a single videotape reel, the randomized video sequences are evenly distributed over two playback tapes, A and B. To guard against unpredicted contextual effects, a second distinct randomization of the test material is also generated. Test results for both randomized Tape Orders, 1 and 2, can then be compared.

Randomizations distinct from those used in Round 1 tests were necessary for the Basic Received Quality tests, due to the inclusion of additional and substitute video sequences. Wherever possible, core video sequences (those common to both Rounds of testing) were slotted identically within the Tape Orders. The randomizations for the 720P and 1080I Basic Received Quality test tapes are the same.

Tapes played back for 1080I, tapes 1A and B were ATTC LICS. codes 11129 - 11214, respectively, and 11098 - 11244 for tapes 2A and B, respectively.

Tapes played back for 720P, tapes 1A and B were ATTC LICS. codes 11140 - 11235, respectively, and 10099 - 10094 for tapes 2A and B, respectively.

BASIC RECEIVED QUALITY RANDOMIZATION FOR ORDER 1, TAPE A

BRQ Order 1A				
Type		Picture Name	Picture Number	Test Condition
Demo	1	Memorial Arch	S10	R-T
Demo	2	Rollercoaster	M42	T-R
Demo	3	Fruits & Vegetables	S7	R-T
Demo	4	Ducks	M43	T-R
Cue Stop		50' Grey		
Warm Up	1	Window	M1	R-T
Warm Up	2	Sculptures	S6	T-R
Warm Up	3	Cheshire Cat	S14A	R-T
Warm Up	4	Christa	M45	T-R
Warm Up	5	End Zone	M39	R-T
Trial	1	Girl with Toys	S9	R-T
Trial	2	Desk	M6	T-R
Trial	3	Tulips	S5	T-R
Trial	4	Christa	M45	T-R
Trial	5	Living Room	M5	R-T
Trial	6	Connections	M48	T-R
Trial	7	Golf	M41	T-R
Trial	8	Woman & Room	M10	R-T
Trial	9	Clock #1	M47	R-T
Trial	10	Meal Table & Chairs	S1	T-R
Trial	11	Toys	S8	R-T
Trial	12	Rotating Pyramids	M16A	R-T
Trial	13	Ass Murderer	M36	R-T
Trial	14	Snow Tires	M38	T-R
Trial	15	Fountain	M46	R-T
Trial	16	Mannequins	M4	R-T
Trial	17	Buckingham Palace	M37	R-T
Trial	18	Picnic with Ants	M49	R-T
Trial	19	Dream Team	M40	T-R
Trial	20	Sculptures	S6	T-R
Trial	21	Crosswalk	M35	R-T
Trial	22	End Zone	M39	R-T
Trial	23	Mirror	M44	T-R

BASIC RECEIVED QUALITY RANDOMIZATION FOR ORDER 1, TAPE B

BRQ Order 1B				
Type		Picture Name	Picture Number	Test Condition
Warm Up	6	Fax Machine	M2	R-T
Warm Up	7	Mirror	M44	T-R
Warm Up	8	Ax Murderer	M36	R-T
Trial	24	Connections	M48	R-T
Trial	25	Snow Tires	M38	R-T
Trial	26	Christa	M45	R-T
Trial	27	Tulips	S5	R-T
Trial	28	Rotating Pyramids	M16A	T-R
Trial	29	Cheshire Cat	S14A	R-T
Trial	30	Girl with Toys	S9	T-R
Trial	31	End Zone	M39	T-R
Trial	32	Living Room	M5	T-R
Trial	33	Woman & Room	M10	T-R
Trial	34	Picnic with Ants	M49	T-R
Trial	35	Ax Murderer	M36	T-R
Trial	36	Golf	M41	R-T
Trial	37	Mirror	M44	R-T
Trial	38	Mannequins	M4	T-R
Trial	39	Fax Machine	M2	T-R
Trial	40	Crosswalk	M35	T-R
Trial	41	Dream Team	M40	R-T
Trial	42	Fountain	M46	T-R
Trial	43	Window	M1	T-R
Trial	44	Metal Table & Chairs	S1	R-T
Trial	45	Clock #1	M47	T-R
Trial	46	Den	M6	R-T
Trial	47	Cheshire Cat	S14A	T-R
Trial	48	Fax Machine	M2	R-T
Trial	49	Window	M1	R-T
Trial	50	Toys	S8	T-R
Trial	51	Sculptures	S6	R-T
Trial	52	Buckingham Palace	M37	T-R

BASIC RECEIVED QUALITY RANDOMIZATION FOR ORDER 2, TAPE A

BRQ Order 2A				
Type		Picture Name	Picture Number	Test Condition
Demo	1	Memorial Arch	S10	R-T
Demo	2	Rollercoaster	M42	T-R
Demo	3	Fruits & Vegetables	S7	R-T
Demo	4	Ducks	M43	T-R
Cue Stop		50% Grey		
Warm Up	1	Window	M1	R-T
Warm Up	2	Sculptures	S6	T-R
Warm Up	3	Cheshire Cat	S14A	R-T
Warm Up	4	Christa	M45	T-R
Warm Up	5	End Zone	4A	R-T
Trial	1	Metal Table & Chairs	S1	R-T
Trial	2	Fountain	M46	R-T
Trial	3	Toys	S8	T-R
Trial	4	Snow Tires	M38	T-R
Trial	5	Girl with Toys	S9	T-R
Trial	6	Living Room	M5	T-R
Trial	7	Cheshire Cat	S14A	R-T
Trial	8	Clock #1	M47	R-T
Trial	9	Christa	M45	T-R
Trial	10	End Zone	M39	R-T
Trial	11	Picnic with Ants	M49	T-R
Trial	12	Mannequins	M4	T-R
Trial	13	Sculptures	S6	R-T
Trial	14	Fax Machine	M2	T-R
Trial	15	Window	M1	R-T
Trial	16	Connections	M48	R-T
Trial	17	Tulips	S5	T-R
Trial	18	Ax Murderer	M36	R-T
Trial	19	Golf	M41	R-T
Trial	20	Deer	M6	T-R
Trial	21	Rotating Pyramids	M16A	T-R
Trial	22	Mirror	M44	R-T
Trial	23	Crosswalk	M35	R-T

BASIC RECEIVED QUALITY RANDOMIZATION FOR ORDER 2, TAPE B

BRQ Order 2B				
Type		Picture Name	Picture Number	Test Condition
Warm Up	6	Fax Machine	M2	R-T
Warm Up	7	Mirror	M44	T-R
Warm Up	8	Ax Murderer	M36	R-T
Trial	24	Mannequins	M4	R-T
Trial	25	Window	M1	T-R
Trial	26	Mirror	M44	T-R
Trial	27	Connections	M48	T-R
Trial	28	Dream Team	M40	R-T
Trial	29	Fax Machine	M2	R-T
Trial	30	Woman & Room	M10	T-R
Trial	31	Christa	M45	R-T
Trial	32	Buckingham Palace	M37	R-T
Trial	33	Living Room	M5	R-T
Trial	34	End Zone	M39	T-R
Trial	35	Dream Team	M40	T-R
Trial	36	Rotating Pyramids	M16A	R-T
Trial	37	Sculptures	S6	T-R
Trial	38	Tulips	S5	R-T
Trial	39	Metal Table & Chairs	S1	T-R
Trial	40	Den	M6	R-T
Trial	41	Buckingham Palace.	M37	T-R
Trial	42	Picnic with Ants	M49	R-T
Trial	43	Golf	M41	T-R
Trial	44	Cheshire Cat	S14A	T-R
Trial	45	Crosswalk	M35	T-R
Trial	46	Ax Murderer	M36	T-R
Trial	47	Toys	S8	R-T
Trial	48	Clock #1	M47	T-R
Trial	49	Girl with Toys	S9	R-T
Trial	50	Woman & Room	M10	R-T
Trial	51	Fountain	M46	T-R
Trial	52	Snow Tires	M38	R-T

APPENDIX B

ATEL EXPERT TECHNICAL REVIEW OF

IMPAIRMENT/INTERFERENCE TEST MATERIAL

(ATV-to-NTSC)

ATEL EXPERT TECHNICAL REVIEW OF IMPAIRMENT/INTERFERENCE TEST MATERIAL

Separate tables are shown for Lower-Adjacent Channel Interference and Co-Channel Interference Tests, for each Desired level of the NTSC signal (moderate or weak). The tables describe the qualitative nature of impairments visible in the Reference (abbreviated Ref.), and the Test sequences (abbreviated TOV).

REVIEW OF IMPAIRMENT/INTERFERENCE TEST MATERIAL

Lower-Adjacent Channel Interference			Desired Level : Moderate
U Level	GIRLS WITH TOYS	CO-CHANNEL	WOMAN WITH ROSES
Ref.	-very mild horizontally aligned noise -mild cross-color and mild smearing	-mild ringing on vertical lines -minor cross-color -camera burn-in on bar graph	-cross-color artifacts in roses -mild dot-crawl -minor color smearing
subTOV	-no change observed	-no change observed	-no change observed
TOV	-very slight increase in luminance noise	-very small increase in noise	-very small increase in noise
TOV+1	-distinct chroma noise -mild increase in luminance noise	-distinct chroma noise -mild increase in luminance noise	-distinct chroma noise -moderate level of luminance noise
TOV+2	-increased luminance noise	-increased luminance noise	-moderate to strong chroma and luminance noise
TOV+3	-increased severity of noise	-strong chroma & luminance noise	-increased visibility of luminance noise
TOV+4	-severe luminance noise -substantial level of chroma noise	-severe luminance and substantial chroma noise	-luminance and chroma noise are severe

Lower-Adjacent Channel Interference			Desired Level : Weak
U Level	GIRLS WITH TOYS	CO-CHANNEL	WOMAN WITH ROSES
Ref.	-mild horizontally aligned luminance noise -minor chroma smearing	-mild horizontally aligned luminance noise -minor ringing along vertical edges -minor chroma noise	-mild horizontally aligned luminance noise -minor cross-color & color smearing
subTOV	-no change observed	- very mild increase in chroma noise	-just perceptible increase in noise
TOV	-mild thermal type chroma and luminance noise that masks the horizontally aligned background noise	-mild increase in chroma and luminance noise	-no increase in severity of noise, however it takes on a more random appearance
TOV+1	-general random chroma noise	-general random chroma noise -introduction of minor luminance noise	-general random chroma noise -introduction of minor luminance noise
TOV+2	-increase in chroma noise -some luminance noise is also evident	-distinct chroma noise -slight increase in luminance noise	-moderate to strong chroma noise
TOV+3	-horizontal picture shift over four fields -strong level of chroma and luminance noise	-very minor picture shift over 1 frame -strong level of chroma and luminance noise	-horizontal picture shift over four fields -moderate to strong chroma and luminance noise
TOV+4	-very severe luminance noise -severe chroma noise	-both chroma and luminance noise are very severe	-very severe luminance noise -strong chroma noise

Co-Channel Interference			Desired Level : Weak
U Level	GIRLS WITH TOYS	CO-CHANNEL	WOMAN WITH ROSES
Ref.	-mild horizontally aligned noise -some color smearing and cross luminance artifacts	-mild horizontally aligned noise -some color smearing and cross luminance artifacts -mild ringing along vertical edges	-mild horizontally aligned noise -some color smearing and cross luminance artifacts
subTOV	-horizontally aligned luminance noise just perceptibly more visible	-horizontally aligned luminance noise just perceptibly more visible	-no visible change
TOV	-aligned noise remains visible -mild increase in chroma noise observed	-addition of mild chroma noise	-very mild chroma noise visible
TOV+1	-fine grained chroma noise distinctly visible -horizontally aligned background noise is masked	-fine grained chroma noise distinctly visible -horizontally aligned background noise is masked	-fine grained chroma noise distinctly visible -some increased random luminance noise
TOV+2	-moderate level of chroma noise	-moderate to high level of chroma noise	-moderate chroma noise
TOV+3	-strong chroma noise	-strong chroma noise	-strong chroma noise
TOV+4	-very strong chroma noise	-very strong chroma noise	-very strong chroma noise

**IMPAIRMENT/INTERFERENCE
PICTURE DESCRIPTION**

- S11 Woman With Roses: Woman and bouquet of roses.
- M6 Girls With Toys: Two girls playing with toys and books, on rug.
- M14 Co-Channel: Man flipping through signs.

RANDOMIZATION OF IMPAIRMENT/INTERFERENCE TEST MATERIAL

The randomization of test material is undertaken to minimize the occurrence of any patterns in the presentation of video sequences and, ideally, eliminate any related viewer bias. Each Tape Order consists of all test sequences arranged in a pseudo-random fashion. Within each Tape Order, limits are set as to the proximity of identical video sequences, and as to the number of consecutive identical test conditions (Ref.-Test, Test-Ref.), picture attributes (motion / still), and picture sources (film, computer graphic, video camera). The objective is to achieve an overall balance of the foregoing factors. Where cumulative playout time exceeds the storage capacity of a single videotape reel, the randomized video sequences are evenly distributed over two playback tapes, A and B. To guard against unpredicted contextual effects, a second distinct randomization of the test material is also generated. Test results for both randomized Tape Orders, 1 and 2, can then be compared.

The randomizations used for Co-Channel and Lower-Adjacent Channel Interference into NTSC are identical to those used in Round 1 tests. Co-Channel tests included one desired signal level (weak), whereas Lower-Adjacent Channel tests included two desired signal levels (moderate and weak). For both CO-A/N and LO-A/N tests, undesired levels ranged from 1 to 6, with level 1 representing subTOV, level 2 representing TOV, level 3 representing TOV+1, etc.

Tapes played back for Co-Channel Interference, tapes 1A and 2A were ATTC LICS. codes 11080 and 11079, respectively.

Tapes played back for Lower-Adjacent Channel Interference, tapes 1A and B were ATTC LICS. codes 11083 - 11077, respectively, and 11197 - 11198 for tapes 2A and B, respectively.

CO-CHANNEL RANDOMIZATION FOR ORDER 1

Order 1					CO-A/N
Type		Desired Level	Undesired Level	Picture Number	Picture Name
Demo	1	Weak	3	S03	Wavy Wall
Demo	2	Weak	3	M11	Lamp
Demo	3	Weak	5	S03	Wavy Wall
Demo	4	Weak	5	M11	Lamp
Warm up	1	Weak	6	S11	Woman with Roses
Warm up	2	Weak	2	M14	Co-channel
Warm up	3	Weak	5	S09	Girl with Toys
Warm up	4	Weak	4	M14	Co-channel
Warm up	5	Weak	3	S11	Woman with Roses
Trial	1	Weak	4	S11	Woman with Roses
Trial	2	Weak	6	S09	Girl with Toys
Trial	3	Weak	4	S11	Woman with Roses
Trial	4	Weak	1	M14	Co-channel
Trial	5	Weak	3	S09	Girl with Toys
Trial	6	Weak	4	M14	Co-channel
Trial	7	Weak	1	S11	Woman with Roses
Trial	8	Weak	5	S11	Woman with Roses
Trial	9	Weak	2	S09	Girl with Toys
Trial	10	Weak	6	S09	Girl with Toys
Trial	11	Weak	3	S11	Woman with Roses
Trial	12	Weak	5	S09	Girl with Toys
Trial	13	Weak	3	S11	Woman with Roses
Trial	14	Weak	1	S09	Girl with Toys
Trial	15	Weak	2	M14	Co-channel
Trial	16	Weak	6	M14	Co-channel
Trial	17	Weak	6	S11	Woman with Roses
Trial	18	Weak	5	M14	Co-channel
Trial	19	Weak	2	S09	Girl with Toys
Trial	20	Weak	1	S11	Woman with Roses
Trial	21	Weak	5	M14	Co-channel
Trial	22	Weak	6	S11	Woman with Roses
Trial	23	Weak	5	S09	Girl with Toys
Trial	24	Weak	2	S11	Woman with Roses
Trial	25	Weak	4	M14	Co-channel
Trial	26	Weak	1	M14	Co-channel
Trial	27	Weak	3	S09	Girl with Toys
Trial	28	Weak	5	S11	Woman with Roses
Trial	29	Weak	2	S11	Woman with Roses
Trial	30	Weak	2	M14	Co-channel
Trial	31	Weak	4	S09	Girl with Toys
Trial	32	Weak	3	M14	Co-channel
Trial	33	Weak	1	S09	Girl with Toys
Trial	34	Weak	3	M14	Co-channel
Trial	35	Weak	6	M14	Co-channel
Trial	36	Weak	4	S09	Girl with Toys

CO-CHANNEL RANDOMIZATION FOR ORDER 2

Order 2					CO-A/N
Type		Desired Level	Undesired Level	Picture Number	Picture Name
Demo	1	Weak	3	S03	Wavy Wall
Demo	2	Weak	3	M11	Lamp
Demo	3	Weak	5	S03	Wavy Wall
Demo	4	Weak	5	M11	Lamp
Warm up	1	Weak	6	S11	Woman with Roses
Warm up	2	Weak	2	M14	Co-channel
Warm up	3	Weak	5	S09	Girls with Toys
Warm up	4	Weak	4	M14	Co-channel
Warm up	5	Weak	3	S11	Woman with Roses
Trial	1	Weak	4	M14	Co-channel
Trial	2	Weak	1	S09	Girls with Toys
Trial	3	Weak	4	S11	Woman with Roses
Trial	4	Weak	6	S09	Girls with Toys
Trial	5	Weak	3	S11	Woman with Roses
Trial	6	Weak	5	S09	Girls with Toys
Trial	7	Weak	6	S11	Woman with Roses
Trial	8	Weak	5	S09	Girls with Toys
Trial	9	Weak	1	M14	Co-channel
Trial	10	Weak	1	S11	Woman with Roses
Trial	11	Weak	4	S11	Woman with Roses
Trial	12	Weak	3	M14	Co-channel
Trial	13	Weak	2	S11	Woman with Roses
Trial	14	Weak	5	M14	Co-channel
Trial	15	Weak	3	S09	Girls with Toys
Trial	16	Weak	2	S09	Girls with Toys
Trial	17	Weak	3	S11	Woman with Roses
Trial	18	Weak	2	S09	Girls with Toys
Trial	19	Weak	2	M14	Co-channel
Trial	20	Weak	1	S09	Girls with Toys
Trial	21	Weak	3	M14	Co-channel
Trial	22	Weak	4	S09	Girls with Toys
Trial	23	Weak	6	M14	Co-channel
Trial	24	Weak	4	S09	Girls with Toys
Trial	25	Weak	5	M14	Co-channel
Trial	26	Weak	1	S11	Woman with Roses
Trial	27	Weak	3	S09	Girls with Toys
Trial	28	Weak	4	M14	Co-channel
Trial	29	Weak	5	S11	Woman with Roses
Trial	30	Weak	1	M14	Co-channel
Trial	31	Weak	5	S11	Woman with Roses
Trial	32	Weak	6	S09	Girls with Toys
Trial	33	Weak	2	S11	Woman with Roses
Trial	34	Weak	6	M14	Co-channel
Trial	35	Weak	2	M14	Co-channel
Trial	36	Weak	6	S11	Woman with Roses

LOWER-ADJACENT CHANNEL RANDOMIZATION FOR ORDER 1, TAPE A

Order 1A					LO-A/N
Type		Desired Level	Undesired Level	Picture Number	Picture Name
Demo	1	moderate	3	S09	Wavy Wall
Demo	2	moderate	3	M11	Lamp
Demo	3	weak	5	S09	Wavy Wall
Demo	4	weak	5	M11	Lamp
Warm up	1	moderate	6	M06	Girls with Toys
Warm up	2	weak	2	M14	Co-channel
Warm up	3	moderate	5	S11	Woman with Roses
Warm up	4	weak	4	M06	Girls with Toys
Warm up	5	weak	3	M14	Co-channel
Trial	1	moderate	4	M14	Co-channel
Trial	2	moderate	6	S11	Woman with Roses
Trial	3	weak	5	S11	Woman with Roses
Trial	4	weak	2	M06	Girls with Toys
Trial	5	weak	4	S11	Woman with Roses
Trial	6	moderate	1	M14	Co-channel
Trial	7	weak	3	M06	Girls with Toys
Trial	8	weak	5	M14	Co-channel
Trial	9	weak	1	M06	Girls with Toys
Trial	10	moderate	3	S11	Woman with Roses
Trial	11	weak	6	M06	Girls with Toys
Trial	12	moderate	5	S11	Woman with Roses
Trial	13	weak	3	M14	Co-channel
Trial	14	weak	6	M14	Co-channel
Trial	15	moderate	2	M06	Girls with Toys
Trial	16	moderate	2	M14	Co-channel
Trial	17	weak	4	M06	Girls with Toys
Trial	18	weak	2	S11	Woman with Roses
Trial	19	moderate	1	M14	Co-channel
Trial	20	moderate	1	M06	Girls with Toys
Trial	21	weak	3	M06	Girls with Toys
Trial	22	moderate	1	S11	Woman with Roses
Trial	23	moderate	3	M06	Girls with Toys
Trial	24	weak	6	M14	Co-channel
Trial	25	weak	2	M14	Co-channel
Trial	26	moderate	6	M06	Girls with Toys
Trial	27	weak	4	S11	Woman with Roses
Trial	28	weak	5	M06	Girls with Toys
Trial	29	weak	6	S11	Woman with Roses
Trial	30	weak	6	M06	Girls with Toys
Trial	31	moderate	4	M06	Girls with Toys
Trial	32	weak	1	M14	Co-channel
Trial	33	weak	5	S11	Woman with Roses
Trial	34	weak	4	M14	Co-channel
Trial	35	moderate	1	S11	Woman with Roses
Trial	36	weak	2	S11	Woman with Roses

LOWER-ADJACENT CHANNEL RANDOMIZATION FOR ORDER 1, TAPE B

Order 1B					LO-A/N
Type		Desired Level	Undesired Level	Picture Number	Picture Name
Warm up	6	moderate	6	M06	Girls with Toys
Warm up	7	weak	2	M14	Co-channel
Warm up	8	moderate	5	S11	Woman with Roses
Trial	37	moderate	6	M06	Girls with Toys
Trial	38	weak	3	M14	Co-channel
Trial	39	moderate	2	M14	Co-channel
Trial	40	moderate	4	M06	Girls with Toys
Trial	41	weak	2	M14	Co-channel
Trial	42	moderate	5	M14	Co-channel
Trial	43	moderate	1	M06	Girls with Toys
Trial	44	moderate	3	M14	Co-channel
Trial	45	moderate	4	S11	Woman with Roses
Trial	46	weak	3	S11	Woman with Roses
Trial	47	moderate	6	M14	Co-channel
Trial	48	moderate	2	M06	Girls with Toys
Trial	49	weak	4	M06	Girls with Toys
Trial	50	weak	6	S11	Woman with Roses
Trial	51	moderate	4	M14	Co-channel
Trial	52	moderate	4	S11	Woman with Roses
Trial	53	weak	1	M06	Girls with Toys
Trial	54	moderate	2	S11	Woman with Roses
Trial	55	moderate	3	M06	Girls with Toys
Trial	56	moderate	3	S11	Woman with Roses
Trial	57	moderate	5	M06	Girls with Toys
Trial	58	weak	1	S11	Woman with Roses
Trial	59	weak	3	S11	Woman with Roses
Trial	60	weak	5	M14	Co-channel
Trial	61	weak	5	M06	Girls with Toys
Trial	62	moderate	2	S11	Woman with Roses
Trial	63	weak	4	M14	Co-channel
Trial	64	weak	1	S11	Woman with Roses
Trial	65	moderate	5	M06	Girls with Toys
Trial	66	weak	1	M14	Co-channel
Trial	67	moderate	5	M14	Co-channel
Trial	68	weak	2	M06	Girls with Toys
Trial	69	moderate	6	M14	Co-channel
Trial	70	moderate	5	S11	Woman with Roses
Trial	71	moderate	3	M14	Co-channel
Trial	72	moderate	6	S11	Woman with Roses

LOWER-ADJACENT CHANNEL RANDOMIZATION FOR ORDER 2, TAPE A

Order 2A					LO-A/N
Type		Desired Level	Undesired Level	Picture Number	Picture Name
Demo	1	moderate	3	S09	Wavy Wall
Demo	2	moderate	3	M11	Lamp
Demo	3	weak	5	S09	Wavy Wall
Demo	4	weak	5	M11	Lamp
Warm up	1	moderate	6	M06	Girls with Toys
Warm up	2	weak	2	M14	Co-channel
Warm up	3	moderate	5	S11	Woman with Roses
Warm up	4	weak	4	M06	Girls with Toys
Warm up	5	weak	3	M14	Co-channel
Trial	1	moderate	4	M06	Girls with Toys
Trial	2	weak	6	M14	Co-channel
Trial	3	weak	2	M06	Girls with Toys
Trial	4	weak	6	M06	Girls with Toys
Trial	5	weak	2	S11	Woman with Roses
Trial	6	moderate	4	M14	Co-channel
Trial	7	moderate	6	M06	Girls with Toys
Trial	8	moderate	2	S11	Woman with Roses
Trial	9	weak	3	M06	Girls with Toys
Trial	10	weak	2	M14	Co-channel
Trial	11	moderate	6	M06	Girls with Toys
Trial	12	moderate	6	M14	Co-channel
Trial	13	moderate	3	M06	Girls with Toys
Trial	14	moderate	3	S11	Woman with Roses
Trial	15	moderate	1	M06	Girls with Toys
Trial	16	weak	4	M14	Co-channel
Trial	17	moderate	4	S11	Woman with Roses
Trial	18	weak	5	M14	Co-channel
Trial	19	weak	2	M14	Co-channel
Trial	20	weak	5	S11	Woman with Roses
Trial	21	moderate	5	M14	Co-channel
Trial	22	moderate	1	S11	Woman with Roses
Trial	23	moderate	3	M06	Girls with Toys
Trial	24	weak	6	S11	Woman with Roses
Trial	25	weak	3	S11	Woman with Roses
Trial	26	moderate	2	M06	Girls with Toys
Trial	27	moderate	4	S11	Woman with Roses
Trial	28	moderate	5	M06	Girls with Toys
Trial	29	moderate	5	S11	Woman with Roses
Trial	30	weak	3	M14	Co-channel
Trial	31	weak	5	S11	Woman with Roses
Trial	32	moderate	5	M06	Girls with Toys
Trial	33	moderate	6	S11	Woman with Roses
Trial	34	weak	2	M06	Girls with Toys
Trial	35	moderate	3	M14	Co-channel
Trial	36	weak	1	M06	Girls with Toys

LOWER-ADJACENT CHANNEL RANDOMIZATION FOR ORDER 2, TAPE B

Order 2B					LO-A/N
Type		Desired Level	Undesired Level	Picture Number	Picture Name
Warm up	6	moderate	6	M06	Girls with Toys
Warm up	7	weak	2	M14	Co-channel
Warm up	8	moderate	5	S11	Woman with Roses
Trial	37	weak	3	M14	Co-channel
Trial	38	moderate	1	M06	Girls with Toys
Trial	39	weak	4	M06	Girls with Toys
Trial	40	weak	1	M14	Co-channel
Trial	41	weak	3	M06	Girls with Toys
Trial	42	weak	4	S11	Woman with Roses
Trial	43	moderate	6	S11	Woman with Roses
Trial	44	moderate	2	M14	Co-channel
Trial	45	moderate	1	S11	Woman with Roses
Trial	46	weak	5	M14	Co-channel
Trial	47	weak	5	M06	Girls with Toys
Trial	48	moderate	4	M14	Co-channel
Trial	49	weak	6	M06	Girls with Toys
Trial	50	moderate	5	S11	Woman with Roses
Trial	51	moderate	6	M14	Co-channel
Trial	52	moderate	4	M06	Girls with Toys
Trial	53	weak	6	M14	Co-channel
Trial	54	weak	2	S11	Woman with Roses
Trial	55	moderate	5	M14	Co-channel
Trial	56	moderate	2	M14	Co-channel
Trial	57	weak	1	M06	Girls with Toys
Trial	58	moderate	1	M14	Co-channel
Trial	59	moderate	2	S11	Woman with Roses
Trial	60	moderate	2	M06	Girls with Toys
Trial	61	weak	1	S11	Woman with Roses
Trial	62	moderate	3	M14	Co-channel
Trial	63	weak	1	S11	Woman with Roses
Trial	64	weak	4	M14	Co-channel
Trial	65	weak	4	S11	Woman with Roses
Trial	66	moderate	1	M14	Co-channel
Trial	67	moderate	3	S11	Woman with Roses
Trial	68	weak	1	M14	Co-channel
Trial	69	weak	5	M06	Girls with Toys
Trial	70	weak	3	S11	Woman with Roses
Trial	71	weak	4	M06	Girls with Toys
Trial	72	weak	6	S11	Woman with Roses

APPENDIX C

ATEL EXPERT TECHNICAL REVIEW OF

RECEIVER SCAN CONVERSION TEST MATERIAL

ATEL EXPERT TECHNICAL REVIEW OF RECEIVER SCAN CONVERSION TEST MATERIAL

A) General comments:

The Receiver Transconversion test tapes (HD-QSC) contain 7 distinct 'types' of video sequences:

1. 1035I format Reference cuts.
2. 1080I Quality cuts modified for 1035I line display (1080I unconverted trials).
3. 1080I format converted to 720P to be displayed in 720P (1080I converted trials).
4. 720P Quality cuts to be displayed in 720P (720P unconverted trials).
5. 720P Quality cuts derived from a 1035I source to be displayed in 720P (720P unconverted trials).
6. 720P format converted to 1080I modified for 1035I line display (720P converted trials).
7. 720P format derived from a 1035I source and converted to 1080I then modified for 1035I display (720P converted trials).

The following chart summarizes observed differences by type:

Type	Image	Content
1	1035I Reference	100% of picture.
2	1080I unconverted	100% of picture, plus 1 or two additional lines at top (a vestige of the 45 line pad added to the 1035I source).
3	1080I converted	100% of image plus approximate 27 line pad ($40 \times 2/3$) at top of image, and 3 line pad ($5 \times 2/3$) at bottom in 720 format.
4	720P unconverted	100% of the 720P source. (note that 720P source material is not completely identical to 1035I References for stills and computer graphic material.)
5	720P unconverted	97.8% of image remains after 2.2% loss at image bottom due to transconversion of motion sequences.
6	720P converted	95.8% of image remains with 3.7% missing at top, and 0.4% missing at bottom.
7	720P converted	93.7% of image remains with 3.7% missing from top, and 2.6% missing at bottom.

B) Projector setups:

Images were presented to viewers on a Hitachi C65-4510R High-Definition projector. Since automated projector switching is limited to two pairs of displays (Low Gang and High Gang), some compromise was required in overscan setups for the Hitachi.

The Low Gang setup was used for the 1080I unconverted pictures (type 2) displayed in the 1035I format. No compensation was required and an excellent picture match resulted.

The High Gang setup was used for the 1080I converted pictures (type 3), displayed in 720P format. The projector High Gang was adjusted such that the 'valid' 100% portion of the image was centered, and then stretched vertically at top and bottom. A small horizontal shift and stretch were also necessary to achieve an excellent visual match with the 1035I Reference.

The Low Gang setup was used for the 720P unconverted pictures (types 4 and 5), displayed in 720P. A small (2.2%) difference exists between motion and still pictures. This difference was split to arrive at the desired overscan setting. A slight horizontal picture shift and stretch was also necessary to achieve a good visual match.

The Low Gang setup was used for the 720P converted pictures (type 6 and 7) displayed in the 1035I format. No display compensation was possible since the image was displayed on the same channel as the Reference picture. A fair to poor picture match resulted for 720P unconverted images, and in particular those originally derived from a 1035I source (type 7). In two of the derived images 'Ducks' and 'Dream Team', the differences are not really noticeable due to the busyness of these sequences. In the images 'Den' and 'Woman in Room', the difference may or may not be detected by non expert viewers.